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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/480,076	01/10/2000	RICKIE C. LAKE	MI40-274	3868

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EXAMINER
HARAN, JOHN T

ART UNIT	PAPER NUMBER
1733	7

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Please find below and/or attached an Office communication concerning this application or proceeding.

MF=7

Office Action Summary	Application No. 09/480,076	Applicant(s) LAKE, RICKIE C.	
	Examiner John T. Haran	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 November 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-14 and 23-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-14 and 23-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. This office action is in response to amendment B filed on 11/20/01. In light of Applicant's arguments all previous rejections are withdrawn.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 9-14 and 23-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 9, the phrase "curing the adhesive into an electrically conductive bond electrically interconnecting the first and second components" renders the claim indefinite because it is unclear whether or not this requires the adhesive to be electrically conductive. It is suggested to specify that the adhesive is conductive by replacing all instances of "curable adhesive" with - - curable, electrically conductive adhesive - -.

The same problem exists in claim 23, and should be similarly fixed.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 9 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chen et al (U.S. Patent 4,975,221).

Chen et al discloses a curable epoxy adhesive for use in attaching electrical components together, such as semiconductor die or chips to a substrate, to form a connection wherein the epoxy adhesive contains an electrically conductive filler and an epoxy functional silane adhesion promotor (Column 1, lines 5-11 and Column 3, line 59 to Column 4, line 5). It is inherent that to use such an adhesive to connect two electrical components that the adhesive is interposed between the components and the adhesive is cured to form an electrically conductive bond. Chen et al anticipate claim 1.

In the alternative, it would have been obvious to one of ordinary skill in the art at the time the invention was made that in order to form an electrical connection between two electrical components with an adhesive, the adhesive must be interposed between the components and cured.

7. Claims 10, 14 and 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (U.S. Patent 4,975,221).

Regarding claims 23-25, Chen et al is silent towards the contact resistance. One skilled in the art would have readily appreciated that only the expected results would be achieved by adding a silane coupling agent to an electrically conductive epoxy adhesive, such as changing the contact resistance. One skilled in the art would be expected to know the desirable contact resistance and to appropriately adjust the adhesive utilized in order to achieve an acceptable contact resistance, such as adjusting metal surface wetting concentration of silane in the epoxy. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have an effective metal surface wetting concentration of silane in the adhesive to obtain the desired contact resistance in the method of Chen et al

Regarding claims 10 and 28, one skilled in the art would have readily appreciated that electronic components with nickel containing metal are well known and conventional and that Chen et al are a general teaching for interconnecting electronic parts. It would have been obvious to connect an electrical component with a nickel containing metal surface to another electrical component in the method of Chen et al, as modified above.

Regarding claims 13-14 and 26-27, it would have been obvious to utilize the desired weight percentages of the epoxy terminated silane in the adhesive composition and only the expected would be achieved.

8. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (U.S. Patent 4,975,221) in view of Tsukagoshi et al (U.S. Patent 5,843,251).

Chen et al are silent towards the type of silane utilized as the adhesion promotor.

Tsukagoshi et al is directed to a method for electrically connecting circuits by interposing an epoxy adhesive between two circuits (Column 3, lines 30-35). The reference teaches adding a silane coupling agent to the epoxy in order to strengthening the adhesive interface of the circuits and to improve moisture resistance, such as glycidoxypropyltrimethoxysilane (Column 10, line 62 to Column 11, line 12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a known silane adhesion promotor in the epoxy adhesive in the method of Chen et al.

9. Claims 9-14 and 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Tsukagoshi et al (U.S. Patent 5,843,251).

The admitted prior art teaches a method of conductively interconnecting electronic components wherein a thin profile battery is electrically connected to other circuits or components with a curable, electrically conductive epoxy adhesive. It is recognized that this sometimes does not result in a suitable electrically conductive bond (Specification, page 1, lines 17-22). The admitted prior art is silent towards utilizing an epoxy terminated silane for the adhesive.

Tsukagoshi et al is directed to a method for electrically connecting circuits by interposing an epoxy adhesive between two circuits (Column 3, lines 30-35). The reference teaches adding a silane coupling agent to the epoxy in order to strengthening the adhesive interface of the circuits and to improve moisture resistance (Column 10, line 62 to Column 11, line 12).

One skilled in the art would have readily appreciated utilizing known techniques to increase the bonding strength of electrical components, such as adding a silane coupling agent to an epoxy as an adhesion promoter. One skilled in the art also would have readily recognized that adding a silane coupling agent to an epoxy creates an epoxy terminated silane. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have added a silane coupling agent to the electrically conductive epoxy adhesive in the method of the admitted prior art as suggested by Tsukagoshi et al.

Regarding claims 23-25, one skilled in the art would have readily appreciated that only the expected results would be achieved by adding a silane coupling agent to an electrically conductive epoxy adhesive, such as changing the contact resistance. One skilled in the art would be expected to know the desirable contact resistance and to appropriately adjust the adhesive utilized in order to achieve an acceptable contact resistance, such as adjusting metal surface wetting concentration of silane in the epoxy. It would have been obvious have an effective metal surface wetting concentration of silane in the adhesive to obtain the desired contact resistance in the method of the admitted prior art, as modified above.

Regarding claims 10 and 28, one skilled in the art would have readily appreciated that electronic components with nickel containing metal are well known and conventional and that Tsukagoshi and the admitted prior art are a general teaching for interconnecting electronic parts. It would have been obvious to connect an electrical component with a nickel containing metal surface to another electrical component in the method of the admitted prior art, as modified above.

Regarding claims 11 and 12, Tsukagoshi et al teach a preferred type of coupling agent for improving the adhesiveness of the circuits is a silane coupling agent such as glycidoxypropyltrimethoxysilane (See Column 10, line 62 to Column 11, line 11).

Regarding claims 13-14 and 26-27, it would have been obvious to utilize the desired weight percentages of the epoxy terminated silane in the adhesive composition and only the expected would be achieved.

Response to Arguments

10. Applicant's arguments with respect to claims 9-14 and 23-28 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John T. Haran whose telephone number is (703) 305-0052. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael W. Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703)

872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

John T. Haran

December 13, 2001

Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700